

AMENDMENT UNDER 37 C.F.R. § 1.111
Application Serial No. 10/631,804
Attorney Docket No. Q76384

REMARKS

Claims 9, 10 and 18-24 are all the claims pending in the application. Claims 9, 22 and 24 are amended. No new matter is presented.

Dealing with preliminary matters first, Applicant notes that the Examiner has not acknowledged the drawings filed August 1, 2003. The Examiner is again requested to indicate acceptance of the drawings in the next action.

To summarize the Office Action, claims 9, 10, 18 and 20 to 24 are rejected under 35 U.S.C. § 102(e) as being anticipated by Hasebe et al. (U.S. Patent No. 6,744,135, hereinafter “Hasebe”), and claims 9, 10 and 18-24 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Nakayama (U.S. Patent Publication No. 2003/0164549). The outstanding rejections are addressed below.

Claim Rejections - 35 U.S.C. § 102(b)

As noted above, claims 9, 10 and 18-24 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Hasebe. This ground of rejection is traversed.

With respect to independent claim 9, Applicant submits that Hasebe fails to teach or suggest all the claimed features of the IC package defined by claim 9. For instance, claim 9 is amended to partially incorporate subject matter from dependent claim 22 to recite “said conductive layer is a ground layer, and said substrate includes another conductive layer, said another conductive layer being a power layer” and “a first of the plural heat sinks are electrically

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connected to the ground layer and a second of the plural heat sinks are electrically connected to the power layer.”

In the grounds of rejection, the Examiner merely contends that Hasebe teaches the conductive layer is a ground layer which is “within the substrate but not shown”, and another conductive layer is a power layer within the substrate. *See* Office Action at page 3. Thus, the Examiner does not identify these limitations, nor provide any explanation to support the assertion that any conductor layer, let alone the claimed power layer, is within the substrate but “not shown”. Moreover, Hasebe fails to teach the first and second plural heat sinks, as claimed, which are connected to the ground layer and the power layer, respectively. Indeed, the “plural heat sinks” (elements 401 and 402 as identified by the Examiner) are disclosed in Figure 4 of Hasebe as being connected to the same conductive layer, and Hasebe fails to suggest the “via hole portions 401 and 402” are in any way different from each other, or connected to different conductive layers. *See* Hasebe at col. 11, lines 55-65.

Thus, Hasebe clearly fails to anticipate all the limitations of claim 9, and reconsideration of the rejection is requested. Further, Applicant submits that Hasebe fails to anticipate all the limitations of independent claim 24, which recites similar features. Thus, claim 24 is likewise believed to be allowable. In addition, claims 10 and 18-23 are believed to be allowable at least by virtue of depending from claim 9.

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Claim Rejections - 35 U.S.C. § 103

With respect to the 35 U.S.C. § 103 rejection based on Nakayama, The Examiner alleges that Nakayama teaches a substrate (11) including a conductive layer (a lower portion of wiring pattern 14); a heat-radiating mechanism (upper portion of wiring pattern 14) that is mounted on the substrate, disposed between the IC chip and substrate, and dissipates heat of the IC chip; wherein the heat-radiating mechanism comprises plural heat sinks (upper portion of wiring pattern 14) and at least part of each heat sink is disposed directly below the IC chip, and wherein terminals of the IC chip and the heat radiating mechanism are electrically connected (by wire 24), and the heat radiating mechanism and the conductive layer of the substrate are electrically connected (referring to the upper and lower portion of wiring pattern 14).

Applicant notes the Examiner contends that the wiring pattern 14 of Nakayama teaches both the claimed heat radiating mechanism and the conductive layer. *See* Office Action at page 4-5. Apparently acknowledging this deficiency in the teaching of Nakayama, the Examiner contends that “it would be obvious to one of ordinary skill in the art to use the plurality of heat sinks and the conductor layer as ‘merely a matter of obvious engineering choice’ as set forth in the above case law.” *See* Office Action at page 5.

Applicant again points out that there is no suggestion in Nakayama that the wiring pattern is a heat sink. Rather, the only heat sinks described in Nakayama are *above* the IC chips (i.e., the heat sinks 112 attached above the IC chip 20 and substrate 11 by a sealant 51; see Nakayama at paragraph 93 on page 5), and not disposed below the IC chip as required by claims 9 and 24. Moreover, although figure 15 may disclose plural heat sinks 112, the heat sinks are clearly not

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electrically connected to either a conductive layer of the substrate or to terminals of the IC chip. Thus, the only heat sinks taught or suggested by Nakayama are suspended above semiconductor devices without any teaching or suggestion of the electrical connection required by claims 9 and 24. *See* Nakayama at paragraphs 22-23 on pages 1-2.

Further, the Examiner provides no explanation as to how a wiring layer, such as disclosed by Nakayama, can simultaneously be a conductive layer while also being plural heat sinks for a heat radiating mechanism which is electrically connected to the conductive layer. Moreover, the Examiner's apparent assertion that use of plural heat sinks and a conductor layer instead of the "wiring layer" cannot properly be considered a design choice without some objective motivation to modify the wiring layer of Nakayama, which fails to suggest a "heat radiating mechanism", as claimed. As discussed above, Nakayama teaches that heat sinks 112 are provided above the IC chip, which would necessarily teach away from the claimed configuration, in which the "heat radiating mechanism" is disposed between the IC chip and the substrate.

Rather, the Examiner provides only conclusory opinions regarding what would allegedly be an "obvious matter of design choice." However, such conclusory allegations are insufficient to establish *prima facie* obviousness. *In re Zurko*, 258 F.3d 1380, 1386, 59 USPQ2d 1694, 1697 (Fed. Cir. 2001) (holding that general conclusions concerning what is "basic knowledge" or "common sense" to one of ordinary skill in the art without specific factual findings and some concrete evidence in the record to support these findings will not support an obviousness rejection); *In re Lee*, 277 F.3d 1338, 1343-1344, 61 USPQ2d 1430, 1434 (Fed. Cir. 2002)

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(stating that the “factual question of motivation is material to patentability, and [can] not be resolved on subjective belief and unknown authority.”)

In addition, Applicant notes that claim 9, as presently recited, requires “said conductive layer is a ground layer, and said substrate includes another conductive layer, said another conductive layer being a power layer” and “a first of the plural heat sinks are electrically connected to the ground layer and a second of the plural heat sinks are electrically connected to the power layer.” As discussed above with respect to the previous grounds of rejection based on Hasebe, claim 9 is amended to partially incorporate subject matter of claim 22. Not unlike the grounds of rejection in Nakayama, the Examiner again addresses this feature by alleging that the ground layer is “within the substrate but not shown”. *See* Office Action at page 5. Thus, the Examiner has again failed to provide any explanation of how this alleged layer that is disclosed, but “not shown”, teaches or suggests the claim limitation. Nakayama cannot properly be relied upon for more than is actually disclosed by the reference, either explicitly or inherently. However, the Examiner fails to provide any explanation to support the interpretation that this “not shown” conductive layer teaches the claimed ground layer, and the grounds of rejection therefore fail to establish that Nakayama teaches all the claim limitations.

Accordingly, reconsideration and withdrawal of the rejection of claim 9 is requested. Further, Applicant submits that the above arguments are equally applicable to claim 24, which recites similar features. Claim 24 is therefore believed to be allowable. Also, as discussed above, claims 10 and 18-23 are believed to be allowable at least by virtue of depending from claim 9.

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Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



Brian K. Shelton
Registration No. 50,245

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE

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